

ABSTRACT OF THE DISCLOSURE

A light modulator includes elongated elements arranged parallel to each other. In a first diffraction mode, the light modulator operates to diffract an incident light into at least two diffraction orders. In a second diffraction mode, the light modulator operates to diffract the incident light into a single diffraction order. Each of the elongated elements comprises a blaze profile, which preferably comprises a reflective stepped profile across a width of each of the elongated elements and which produces an effective blaze at a blaze angle. Alternatively, the blaze profile comprises a reflective surface angled at the blaze angle. Each of selected ones of the elongated elements comprise a first conductive element. The elongated elements produce the first diffraction when a first electrical bias is applied between the first conductive elements and a substrate. A relative height of the blazed portions are adjusted to produce the second diffraction when a second electrical bias is applied between the first conductive elements and the substrate. In an alternative embodiment, each of the elongated elements includes the first conductive element and multiple elongated elements are arranged in groupings, where each of the groupings includes at least three of the elongated elements. When the multiple elongated elements are at a first height, the incident light reflects from the elongated elements. When relative heights of the multiple elongated elements are adjusted by applying individual electrical biases between the first conductive elements and the substrate, the incident light diffracts into the single diffraction order.